

GENERATING GRAPHICAL BAR CODES BY HALFTONING WITH EMBEDDED GRAPHICAL ENCODING

ABSTRACT

Systems and methods for generating graphical bar codes (i.e., images that
5 contain inconspicuous graphical modulations that encode embedded information) by
halftoning with embedded graphical encoding are described. In one aspect, a
graphical bar code is generated by halftoning regions of an original image. The
original image regions incorporate errors diffused among regions of the original
image and computed based at least in part upon modulations in the graphical bar
10 code corresponding to a graphical encoding of a message. In another aspect, a
graphical bar code is decoded by generating a base image having halftone regions
representative of an original image. Regions of the base image are compared
probabilistically to a set of graphical code words to obtain a sequence of graphical
code words corresponding to a graphical encoding of a message. The sequence of
15 graphical code words is decoded to produce a decoded message.